



ATHE Level 5 Diploma in Computing

601/4880/9

Specification Version 3.0 Valid from 1 December 2019



Contents

About ATHE	3
Our Qualifications	3
Support for Centres	3
ATHE Level 5 Diploma in Computing	3
Recognition Dates	3
Entry Requirements	4
Reasonable Adjustments and Special Considerations	4
Introduction to ATHE's Level 5 Diploma in Computing	5
Support and Recognition	5
Progression	5
Recognition of Prior Learning (RPL)	5
Support for ATHE Qualifications	5
Guided Learning Hours (GLH)	6
Total Qualification Time (TQT)	6
Credit	6
Qualification structure ATHE Level 5 Diploma in Computing	7
Guidance on Assessment	7
Methods of Assessment	7
Recording Assessment Judgements	8
Putting an Assessment Strategy in Place	8
Grading system	8
Qualification Grading Structure	9
Determining the Overall Qualification Grade	9
Quality Assurance of Centres	9
Malpractice	9
Guidance for Teaching and Learning	9
Top Tips for Delivery	10
Resources	10
Unit Specifications	11
Cyber Security	12
Database Design and Development	13
Web Based Development	15
Network Design	17
Ethical, Legal and Regulatory Issues and Professional Responsibilities in IT	19
Strategic Management Information Systems	21
Innovative Technologies in Computing	23
Computing Research Methods	24
Managing a computing project	26
Software development methodologies	28

About ATHE

Awards for Training and Higher Education (ATHE) is a global awarding organisation, regulated by Ofqual and other UK and International regulators. We provide centres with a wide variety of qualifications including but not limited to business & management, health & social care management, travel & tourism management and computing.

For a full list please visit our website: www.athe.co.uk

ATHE has also developed a range of bespoke qualifications for clients.

We are known for our excellent customer service, efficient support and flexible qualifications that offer diverse progression routes.

Our Qualifications

Our qualifications are the culmination of expert input from colleges, higher education, industry professionals and our qualification development team. We have taken advantage of the flexibility of the RQF to develop a suite of awards, certificates and diplomas that offer progression across many of the RQF levels.

Support for Centres

We are committed to supporting our centres and offer a range of training, support and consultancy services including:

- qualification guidance, suggested resources and sample assignments
- an ATHE centre support officer who guides you through the centre recognition process, learner registration and learner results submission
- health check visits to highlight any areas for development
- an allocated ATHE associate for advice on delivery, assessment and verification

ATHE Level 5 Diploma in Computing

This document provides key information on ATHE's Level 5 Diploma in Computing, including the rules of combination, the content of all the units and guidance on assessment and curriculum planning. It should be used in conjunction with the ATHE handbook "Delivering ATHE Qualifications". Further guidance on resources and assessment is provided separately.

This qualification is regulated by Ofqual and is listed on Ofqual's Register of Regulated Qualifications. Each qualification has a Qualification Number. This number will appear on the learner's final certification Document. Each unit within a qualification also has a Unit Reference Number.

The QN number for this qualification is as follows:

ATHE Level 5 Diploma in Computing	601/4880/9
-----------------------------------	------------

Recognition Dates

This qualification is recognised from 1st November 2014 which is the operational start date in centres.

Availability

This qualification is available to learners who are registered at a recognised ATHE centre which is based in England, Wales or internationally outside of the United Kingdom.

Entry Requirements

This qualification is designed for learners who are typically aged 18 and above.

ATHE's policy regarding access to our qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from any barriers that restrict access and progression
- there should be equal opportunities for all those wishing to access the qualifications

Centres should review the prior qualifications and experience of each learner and consider whether they provide the necessary foundations to undertake the programme of study at level

5. For learners with disabilities and specific needs, this review will need to take account of the support available to the learner during teaching and assessment of the qualification.

For learners who have recently been in education or training the entry profile is likely to include:

- prior study in computing or related subjects at level 4 or above a level 4 qualification for example an ATHE Level 4 Diploma in Computing
- other equivalent international qualifications

Learners may also have relevant work experience.

Mature learners may present a more varied profile of achievement that is likely to include relevant work experience (paid and/or unpaid) with levels of responsibility, participation and/or achievement of relevant professional qualifications. This may be used for recognition of prior learning (RPL).

Learners must also have an appropriate standard of English to enable them to access relevant resources and complete the unit assignments.

For those whom English is not their first language we recommend the following standards of proficiency in English language skills or an approved equivalent for this qualification:

- IELTSs 5.5
- Common European Framework of Reference (CEFR) B2
- Cambridge English Advanced (CAE) 162 or above
- Pearson Test of English (PTE) Academic 42-49

Centres are required to recruit learners to qualifications with integrity. Centres must carry out robust initial assessment to ensure that learners who undertake these qualifications have the necessary background knowledge, understanding and skills to undertake the learning and assessment at level 5.

ATHE will review centre recruitment policies as part of their monitoring processes.

Reasonable Adjustments and Special Considerations

ATHE's policy on reasonable adjustments and special consideration aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the Equality Act 2010) without compromising the assessment of skills, knowledge and understanding. Where the learner has been awarded a Reasonable Adjustment or Special Consideration this must be recorded on the assessment sheet and the learner record. External Verifiers will take account of this information at the external verification of learner work. Further details on Reasonable Adjustments and Special Considerations are provided in the policy document, which can be found on our website. Please contact ATHE if you uncertain about adjustments for certain learners.

Introduction to ATHE's Level 5 Diploma in Computing

Our new qualification in Computing at Level 5 has been developed to conform to the requirements of the RQF, to meet the requirements of the sector and to respond to the needs of our centres.

This qualification provides the core knowledge, understanding and skills to support learners planning to further their studies in computing. It is equivalent to the second year of a degree programme in Computing. Learner may also progress from this qualification to employment in the sector.

Support and Recognition

This qualification has been developed with the support of higher education providers and centres who are planning to deliver computing qualifications at this level.

Progression

On successful completion of a Level 5 qualification in Computing there are a number of progression opportunities.

Learners may progress to:

employment in a computing and/or technology role at an appropriate level
the final year of a degree programme

Recognition of Prior Learning (RPL)

The RQF is based on the principle of credit accumulation and transfer. Learners have the opportunity to build their achievements from a single unit into a full Diploma.

There will be occasions where learners wish to claim recognition of prior learning which has not been formally assessed and accredited. ATHE has provided detailed guidance on RPL which is available for centres on the ATHE website. Centres may also contact ATHE directly to obtain further clarification or discuss the requirements for RPL.

Resources Required by Centres

ATHE expects centres to provide the right human and physical resources needed to ensure the quality of the learner experience. Centres must ensure that staff have the appropriate level of subject knowledge and are normally qualified to at least a degree standard. It is desirable that staff have a teaching and/or assessing qualification and practical experience of this sector.

The physical resources required will vary depending on the style of delivery. Where distance or blended learning is used, ATHE expects centres to have appropriate learning support materials, infrastructure and technology in place to meet student needs.

This information will be checked by external verifiers on their visits to centres.

Support for ATHE Qualifications

ATHE provides a wide range of support. This includes:

- materials on our website to support assessment and teaching and learning
- training events to support the delivery of the qualifications and assessment
- the services of a team of experienced advisors and external verifiers
- support for business development

ATHE definition of Total Qualification Time (TQT), Guided Learning Hours (GLH) and Credit

Values for Total Qualification Time, Guided Learning Hours and Credit, are calculated by considering the different activities that a Learner would **typically** complete to demonstrate achievement of the learning outcomes of a qualification.

The needs of individual learners and the differing teaching styles used mean there will be variation in the

actual time taken to complete a qualification.

Values for Total Qualification Time, Guided Learning Hours and Credit **are estimates**.

Guided Learning Hours (GLH)

The term Guided Learning Hours (GLH) is an estimate of the amount of time, **on average**, that a tutor, trainer, workshop facilitator etc., will work with a learner, to enable the learner to complete the learning outcomes of a unit to the appropriate standard.

GLH are intended to provide guidance for centres on the amount of time required to deliver the programme and support learners. GLH are made up of activities completed by the learner under direct instruction or supervision of a tutor/teacher, lecturer, supervisor, trainer etc. whether through actual attendance or via electronic means, the activity must be in real time.

Some examples of activities that can contribute to Guided Learning Hours include:

- Supervised induction sessions
- Learner feedback with a teacher in real time
- Supervised independent learning
- Classroom-based learning supervised by a teacher
- Work-based learning supervised by a teacher
- Live webinar or telephone tutorial with a teacher in real time
- E-learning supervised by a teacher in real time
- All forms of assessment that take place under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training, including where the assessment is competence-based and may be turned into a learning opportunity.

Total Qualification Time (TQT)

Total Qualification Time (TQT) is a guide to the amount of time a learner would take, **on average**, to complete the different activities to demonstrate achievement of the learning outcomes of a whole qualification.

TQT includes all the activities described under guided learning hours (GLH) plus all the **additional learning**. Additional learning will take place away from the classroom and this will **not** be under direct supervision of a tutor/teacher, lecturer, supervisor, trainer etc. The activities will vary depending on the qualifications, their level and the nature of the learning.

Some examples of activities that can contribute to Total Qualification Time, include:

- Preparation for classes
- Independent and unsupervised research/learning
- Unsupervised work on assignments
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning
- Unsupervised e- assessment
- Unsupervised e-assessment
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning
- Any other form of learning, education or training, not under the direct supervision of a tutor/teacher, lecturer, supervisor, trainer.

Credit

The credit value specifies the number of credits that will be awarded to a learner who has achieved the learning outcomes of a unit at the specified standard.

Each credit represents 10 hours of learning time and equates to 10 hours of total qualification time.

Therefore, one 15 credit unit represents 150 hours of total qualification time. Learning time is a notional measure which indicates the amount of time a learner at the level of the unit is expected to take, on average, to complete the learning outcomes of the unit to the standard determined by the assessment

criteria.

Learning time includes all the activities described under guided learning hours and additional learning. The credit value of the unit will remain constant in all contexts regardless of the assessment method or the mode of delivery. Learners will only be awarded credits for the successful completion of whole units.

Qualification structure

ATHE Level 5 Diploma in Computing

The ATHE Level 5 Diploma in Computing is a 120-credit qualification.

Rules of combination

Learners must complete all the 10 mandatory units totalling 120 credits.

The Total Qualification Time is 1200 hours

The total guided learning hours is 480

Total Credit Value is 120

Unit Codes	Unit Title	Level	Credit	GLH
Mandatory Units				
D/506/8020	Cyber Security	5	12	48
H/506/8021	Database Design and Development	5	12	48
M/506/8023	Web Based Development	5	12	48
K/506/8022	Network Design	5	12	48
T/506/8024	Ethical, Legal and Regulatory Issues and Professional Responsibilities in IT	5	12	48
F/506/8026	Strategic Management Information Systems*	5	12	48
Y/506/8033	Innovative Technologies in Computing	5	12	48
A/506/8025	Computing Research Methods	5	12	48
J/506/8027	Managing a Computing Project	5	12	48
R/506/8032	Software Development Methodologies	5	12	48

Guidance on Assessment

For all ATHE qualifications assessment is completed through the submission of internally assessed learner work. To achieve a pass for a unit, a learner must have successfully achieved the learning outcomes at the standards set by the assessment criteria for that unit. There is no external assessment (i.e. examinations) attached to any unit; nor is there any dissertation requirement.

ATHE will provide a sample assignment for each unit which can be used as the assessment for the unit. We would encourage our centres to develop their own assessment strategies so you have the opportunity to put assignments in a context that is appropriate for your learners. Any assignments that you devise will need to be submitted to ATHE for approval before delivery of the programme. Centres can submit assignments for approval using the 'Centre- Devised Assignment' template documentation available on the ATHE website.

An assignment can relate to a single unit or an integrated assignment, incorporating more than one unit, can be used provided the content of the assignment is clearly mapped to show which assessment criteria from which units are being covered.

Methods of Assessment

ATHE encourages the use of a range of assessment methods that will engage learners and give
© ATHE Ltd 2019
01/12/2019 v3.0

them an opportunity to both demonstrate their knowledge and understanding of a topic and to evaluate how they might apply that knowledge in a given context.

We would recommend the use of a variety of types of assessment. This might include assessment through:

- A research activity resulting in the compilation of a report
- An academic paper or article for publication
- The compilation of a case study
- A project in response to a design brief (for example a computer programme/a data base)
- The production of a portfolio of evidence relating to a particular unit
- The creation of a prototype for a specified product

This list is by no means exhaustive but gives examples of some assessment methods that could be adopted.

Recording Assessment Judgements

Assessors are required to record assessment judgements for each student by unit. ATHE has provided a template for centres to use to record their judgements and this form should be used. The form enables the centre to record any adjustments due to special considerations or reasonable adjustments. Any adjustments following appeals should also be recorded. These records must be retained as they will be checked at external verification visits. All learner work must be retained for a minimum of 4 years after certification has taken place.

Putting an Assessment Strategy in Place

You will need to demonstrate to your External Verifier that you have a clear assessment strategy supported by robust quality assurance in order to meet the ATHE requirements for registering learners for a qualification. In devising your assessment strategy, you will need to ensure:

- Devised assignments are clearly mapped to the unit learning outcomes and assessment criteria they have been designed to meet.
- That the command verbs used in the assignment are appropriate for the level of the qualification, e.g. analyse, evaluate.
- That the assignment gives the learner sufficient opportunity to meet the assessment criteria at the right level, through the work they are asked to complete (The RQF level descriptors will be helpful to you in determining the level of content of the assessment).
- Students are well-briefed on the requirements of the unit and what they have to do to meet them.
- Assessors are well trained and familiar with the content of the unit/s they are assessing.
- There is an internal verification process in place to ensure consistency and standardisation of assessment across the qualification.
- Assessment decisions are clearly explained and justified through the provision of feedback to the learner.
- That work submitted can be authenticated as the learner's own work and that there is clear guidance on the centre's Malpractice Policy.
- That there is an assessment plan in place identifying dates for summative assessment of each unit and indicating when external verification will be needed.
- Sufficient time is included in the assessment planning to allow the learners time for any necessary remedial work that may be needed prior to certification.

Grading

Grading system

This qualification involves assessment using judgements against 'Pass' Assessment Criteria to decide about whether a learner has met the required standard. Our grading system is straightforward and we do not currently envisage the need to change this. However, should a change become necessary, the change would be published in an updated version of the specification with a clearly revised version number and a new 'valid from' date on the front cover. We will write to all centres in good time to inform them of this change so that plans for any changes can be to your programme delivery, internal assessment and quality assurance arrangements.

The ATHE grading system where a qualification result can be either Pass or Fail is as currently follows and we plan to maintain this system for the foreseeable future:

- Learner meets all Learning Outcomes at Pass standards stated in assessment criteria in a unit > Learner gains a Pass for the unit
- Learner does not meet all Learning Outcomes at Pass standards stated in the assessment criteria in a unit > Learner gains a Fail for the unit
- Learner achieves a Pass for all the required units in the rules of combination > learner achieves a Pass for the qualification
- Learner does not achieve a Pass for all the required units in the rules of combination > learner achieves a Fail for the qualification but may receive unit credit certification for those units achieving a Pass.

Qualification Grading Structure

Determining the Overall Qualification Grade

Each unit is graded pass or fail. As well as receiving a grade for each individual unit learners will receive an overall grade for the qualification. Each unit is equally weighted.

To achieve a Pass grade for the qualification the learner must achieve a Pass for all the required units in the rules of combination.

Quality Assurance of Centres

Centres delivering ATHE RQF qualifications must be committed to ensuring the quality of the units and qualifications they deliver, through effective standardisation of assessors and verification of assessor decisions. ATHE will rigorously monitor the application of quality assurance processes in centres.

ATHE's quality assurance processes will include:

- Centre approval for those centres who are not already recognised to deliver ATHE qualifications
- Approval to offer ATHE RQF qualifications and units in Computing at Level 5

Once a centre registers learners for a qualification, they will be allocated an External Verifier who will visit at an early stage in the programme to ensure that an appropriate assessment plan is in place.

Centres will be required to undertake training and standardisation activities as agreed with ATHE. Details of ATHE's quality assurance processes are provided in the ATHE Guide: "Delivering ATHE Qualifications" which is available on our website.

Malpractice

Centres must have a robust Malpractice Policy in place, with a clear procedure for implementation. Centres must ensure that any work submitted for verification can be authenticated as the learner's own.

Centres should refer to the ATHE Malpractice Policy on the ATHE website.

Guidance for Teaching and Learning

Learners learn best when they are actively involved in the learning process. We would encourage practitioners delivering our qualifications to use a range of teaching methods and classroom-based activities to help them get information across and keep learners engaged in the topics they are learning about. Learners should be encouraged to take responsibility for their learning and should be able to demonstrate a high degree of independence in applying the skills of research and evaluation. You can facilitate this by using engaging methods of delivery that involve active learning rather than relying on traditional methods of lecture delivery to impart knowledge.

Your approach to delivery should give the learners sufficient structure and information on which to build without you doing the work for them. In achieving the right balance you will need to produce well-planned sessions that follow a logical sequence.

Top Tips for Delivery

- Adopt a range of teaching and learning methods, including active learning.
- Plan sessions well to ensure a logical sequence of skills development.
- Include study skills aspects, e.g. how to construct a report or Harvard Referencing. Build time into your Scheme of Work and Session Plans to integrate study skills teaching.
- Set structured additional reading and homework tasks to be discussed in class.
- Elicit feedback from your students. Get them to identify where the work they've done meets the assessment criteria.
- Contextualise your activities, e.g. using real case studies as a theme through the sessions.
- Take an integrated approach to teaching topics across units, where appropriate, rather than always taking a unit-by-unit approach. In this way, learners will be able to see the links between the content of the different units.

There is further guidance on teaching and learning in the support materials.

Resources

ATHE has provided a list of suggested reading resources and the minimum software/hardware required to deliver the qualification. Please refer to the qualification guidance webpage to access these resources.

Unit Specifications

Unit Format

Each unit in ATHE's suite of level 5 qualifications is presented in a standard format. This format provides guidance on the requirements of the unit for learners, tutors, assessors and external verifiers.

Each unit has the following sections:

Unit Title

The unit title reflects the content of the unit. The title of each unit completed will appear on a learner's statement of results.

Unit Aims

The unit aims section summarises the content of the unit.

Unit Code

Each unit is assigned a RQF unit code that appears with the unit title on the Register of Regulated Qualifications.

RQF Level

All units and qualifications in the RQF have a level assigned to them which represents the level of achievement. The level of each unit is informed by the RQF level descriptors. The RQF level descriptors are available on the ATHE website.

Credit value

The credit value is the number of credits that may be awarded to a learner for the successful achievement of the learning outcomes of a unit.

Guided Learning Hours (GLH)

Guided learning hours is an estimate of the amount of time, on average, that a tutor, trainer, workshop facilitator etc., will work with a learner, to enable the learner to complete the learning outcomes of a unit to the appropriate standard.

Total Qualification Time (TQT)

TQT represents the total time required for a learner to complete a qualification.

Learning Outcomes

The learning outcomes set out what a learner is expected to know, understand or be able to do as the result of the learning process.

Assessment Criteria

The assessment criteria describe the requirements a learner is expected to meet in order to demonstrate that the learning outcome has been achieved. Command verbs reflect the level of the qualification e.g. at level 5 you would see words such as analyse and evaluate

Unit Indicative Content

The unit indicative content section provides details of the range of subject material for the programme of learning for the unit.

Cyber Security	
Unit Aims	Learners will develop an understanding of the importance of cyber security to organisations. They will understand industry standards of cyber security and be able to recommend improvements in security to a client's network.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for this unit. Additional guidance is provided on the ATHE sample assignment brief. Learners must base some of the work on an actual organisation and on a network which has vulnerabilities. This must be agreed with the tutor as the learner will need permission to test the system to reveal these vulnerabilities.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand the impact of cyber security threats to organisations	1.1 Analyse current cyber security risks to organisations 1.2 Critically assess the vulnerability of computer network security in a chosen organisation 1.3 Evaluate the impact of cyber security on a chosen organisation
Indicative Content	
<ul style="list-style-type: none"> • Cyber security risks: authentication, educating staff, software and hardware vulnerabilities. • Network vulnerabilities: network vulnerability analysis, network exposures, conducting network vulnerability scans, vulnerability verification and reporting • Impact of cyber security: network security concepts, network security threats, security attacks 	
2. Understand industry standards of cyber security	2.1 Evaluate different controls to manage cyber security risks 2.2 Critically evaluate cyber security strategies within an organisation against industry standards
Indicative Content	
<ul style="list-style-type: none"> • Cyber security management: cyber risk management, reducing cyber risks, information risk management regimes • Cyber security strategies: identifying security objectives, assessing network security threats, dealing with security challenges, tackling cyber crime 	
3. Be able to recommend improvements to secure a network for a client against cyber attacks	3.1 Determine possible improvements to a client's secure network 3.2 Develop network security training plan for a client
Indicative Content	
<ul style="list-style-type: none"> • Network security improvements: network monitoring, security controls, network boundaries, security configuration, user privileges, incident handling • Training in network security: user awareness, network security training, prevention mechanisms 	

Database Design and Development	
Unit Aims	Learners will extend their understanding of database design and development. They will research database management systems and will design and implement a complex database.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for this unit. Additional guidance is provided on the ATHE sample assignment brief. Learners will design a relational database in line with the client brief and they will need to demonstrate advanced database skills during the implementation stage.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand database management systems	1.1 Evaluate the role of databases within organisations 1.2 Critically evaluate the database design process for a complex database 1.3 Explain techniques that can be used to connect databases to other applications 1.4 Recommend a database management system to design a complex database
Indicative Content	
<ul style="list-style-type: none"> Developing databases for organisations: organisational structures, data elements, data sets, forms and reports Database design: entities, relationships, attributes, keys, data types, normalisation Database connectivity: connecting databases to applications, relational database connectivity, ODBC, JDBC Database management systems: 	
2. Be able to design a relational database in line with a client brief	2.1 Plan the design of a complex relational database in response to a client brief 2.2 Design a complex relational database in response to a client brief 2.3 Normalise data to 3rd normal form
Indicative Content	
<ul style="list-style-type: none"> Planning relational database design: database requirements, ERD, DFD, data dictionary, decomposition, functional dependencies Database design: Designing database table, Creating database indexes and constraints, Designing SQL queries, forms, macros, security Normalisation: Identifying insufficiency of normal forms, Comparing normal forms, 1NF, 2NF and 3NF, De-normalisation 	
3. Be able to implement a database design	3.1 Construct a complex database to meet a design brief 3.2 Implement database design features to meet design brief 3.3 Test the database to ensure it meets a client brief
Indicative Content	

<ul style="list-style-type: none"> • Database construction: advanced SQL queries, user actions • Implementing database features: database security features, database links (LAMP, WAMP), graphical user interfaces (GUI) • Database testing: testing plans, database components, extreme data, error handling 	
4. Be able to review the process of design and implementation of a database	4.1 Critically evaluate design documentation identifying improvements where appropriate 4.2 Review the database implementation process to establish lessons learned
Indicative Content	
<ul style="list-style-type: none"> • Database documentation: database architecture, database documentation components • Database development review: design review, code inspection, security inspection, post implementation review 	

Web Based Development	
Unit Aims	Learners will develop an understanding of web based development They will research different technologies that can be used to create dynamic and interactive websites and they will use this research to develop their own website. They will investigate e-marketing and SEO techniques to promote web sites and they will suggest appropriate techniques to solve a business problem. Learners will create a back end database to allow the database to interact with the website. They will critically review the web-based solution against client requirements.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand client side and server side technologies	1.1 Critically compare client side and server side technologies 1.2 Evaluate the effectiveness of different web services to meet a client brief 1.3 Evaluate different dynamic and interactive web applications
Indicative Content	
<ul style="list-style-type: none"> Client server technologies: client server architecture, client side development explained, server side development explained Web services: introduction to web services, data exchange, WSDL, SOAP, RDF, XML Web applications: websites development, database design, three-tiered architecture, interface design 	
2. Understand e-marketing techniques to promote business online	2.1 Critically evaluate e-marketing techniques to promote business online 2.2 Critically review legal, ethical and social issues related to e-marketing
Indicative Content	
<ul style="list-style-type: none"> E-marketing techniques: e-marketing strategies, e-marketing channels, social media, SEO Issues relating to e-marketing deployment: legislation, ethics, social acceptance 	
3. Be able to create a web-based solution to a business problem	3.1 Construct a web-based solution to a business problem 3.2 Integrate e-marketing techniques into the web-based solution 3.3 Create a backend database to interact with the web-based solution 3.4 Integrate multimedia techniques in the web-based solution 3.5 Integrate web services in the web-based solution

Indicative Content

- Web based solutions: web page development, web interface design, accessibility issues, usability issues
- E-marketing development: identifying suitable SEO strategies, SEO techniques, e-marketing techniques and tools
- Back-end design: server side development, WAMP, PHP, SQL
- Multimedia techniques: integrating multimedia to web interfaces, multimedia techniques (e.g. virtual light box, wow slider)
- Web services: web service specification, publishing web services, using web services

4. Be able to review a web-based solution

- 4.1 Evaluate client side and server side technologies implemented, against agreed success criteria
- 4.2 Justify the e-marketing SEO techniques chosen for the web-based solution
- 4.33 Propose improvements to a web-based solution

Indicative Content

- Review implemented technologies and their appropriateness to solve business problem: Server side versus client side development, Explaining the importance of layered architectures for web development
- Evaluate: Evaluating web services, Mapping web services to user needs, The role of web services in web application development
- Justify: Reviewing SEO practices, Success criteria for SEO techniques, Assessing SEO practices and their suitability for specific web applications
- Reflect –Web application development methods, Web application deployment, Web application maintenance, Skills for web application development

Network Design	
Unit Aims	Learners will learn IT network design fundamentals and will design a network for a client in accordance with a design brief.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand networking fundamentals	1.1 Critically evaluate rules of network protocols 1.2 Evaluate the hardware and software needed to run an IT network successfully 1.3 Assess common methods of managing mobile devices on wireless networks 1.4 Analyse the tools available to manage a network
Indicative Content	
<ul style="list-style-type: none"> • Network protocols: the role of a network protocol, protocol types, network protocol examples • Network hardware and software: networking devices, networking applications, network operating systems • Wireless networks: wireless network types, wireless network devices, uses of wireless networks • Network management: network monitoring, device management, network management systems 	
2. Be able to design an IT network in accordance with a design brief	2.1 Analyse business needs to design a network 2.2 Critically evaluate possible solutions to meet a design brief 2.3 Design a structured network to meet a design brief 2.4 Develop viable alternative solutions to meet a design brief
Indicative Content	
<ul style="list-style-type: none"> • Network requirements: bandwidth, availability, application connectivity • Networking evaluation: evaluation methodologies, assessing network objectives, evaluation results • Network design: topology, forecasting networking needs, network traffic • Networking solutions: client devices, access points, network unification, network management 	
3. Be able to build a network to meet a client brief	3.1 Build a network to meet a client brief 3.2 Test network against the requirements of the client brief 3.3 Evaluate performance issues of built network against client brief 3.4 Recommend security requirements to keep a network safe and secure from unwanted cyber threats/attacks

Indicative Content

- Network architecture: types of networks, topologies, physical infrastructure
- Network testing: identifying testing objectives, testing criteria, testing results
- Network performance: selecting performance criteria, measuring network performance
- Network security: network auditing, dealing with network threats, security measures, security policy

Ethical, Legal and Regulatory Issues and Professional Responsibilities in IT	
Unit Aims	Learners will develop understanding of ethical, legal, regulatory issues and professional responsibilities relating to working in IT.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand ethical issues in IT	1.1 Critically evaluate current ethical issues in IT 1.2 Critically review development of ethical practices in IT 1.3 Explain ethical issues relating to data mining 1.4 Assess the importance of ethical guidelines in IT 1.5 Evaluate the impact of current ethical issues on an organisation
Indicative Content	
<ul style="list-style-type: none"> • Ethics and IT: ethics explained, codes of conduct, corporate credo • Ethical practices: confidentiality, integrity, relationships • Ethical data mining: data marketing, data gathering techniques, manipulating personal data • Ethical good practice: IT role responsibilities, responsibilities against others, responsibilities against the society • Ethics in organisations: privacy, accuracy, security 	
2. Understand legal and regulatory issues relating to the use of IT in organisations	2.1 Evaluate current legal and regulatory issues relating to the use of IT in organisations 2.2 Evaluate the impact of a legal or regulatory issue in IT on an organisation 2.3 Explain a contracting process relating to IT development 2.4 Assess the impact of legislation in human computer interaction
Indicative Content	
<ul style="list-style-type: none"> • Legal issues in IT: legislation overview, IT specific legislation • Regulatory issues in IT: standards and regulations, policies (access control, electronic messaging, monitoring, remote access, server security) • IT contracts: employment contracts, development agreements, confidentiality agreements, collaborative agreements, Intellectual Property • Impact of legislation in HCI design: functionality, usability, reliability, efficiency, maintainability, portability 	

<p>3. Understand professional responsibilities relating to working in IT</p>	<p>3.1 Explain the standards that apply to working as a Professional within the IT industry</p> <p>3.2 Assess self against professional knowledge, skills and competence required to work as a Professional in the IT industry</p> <p>3.3 Plan how to address any areas requiring development in order to achieve professional competence</p>
<p>Indicative Content</p>	
<ul style="list-style-type: none"> • IT professional standards: ITPS disciplines • Competencies required for IT professionals: technology awareness, management, communication • Skills required for IT professionals: analytical, design, development 	

Strategic Management Information Systems	
Unit Aims	Learners will develop an understanding of the importance of integrating organisational strategy with information systems and the tools and techniques that can be used to analyse strategy. They will analyse business processes and recommend improvements.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand links between information systems and organisational strategy	1.1 Explain the links between information systems and organisational strategy 1.2 Evaluate tools that can be used to analyse organisational strategy 1.3 Evaluate frameworks for integrating information systems with organisational strategy 1.4 Analyse the benefits to organisations of integrating
Indicative Content	
<ul style="list-style-type: none"> Information Systems explained: data versus information, information needs, system functionality Organisational strategy: structure, capabilities, corporate culture, performance criteria, operations Integrating IS: strategy support, data processing, decision support, communication support, resource management The role of IS in organisations: market awareness, organisational responsiveness, supply chain management 	
2. Be able to analyse the links between strategy and information systems within an organisation	2.1 Evaluate an organisation's strategy using strategic management tools and techniques 2.2 Assess the extent to which information systems are integrated with a chosen organisation's strategy
Indicative Content	
<ul style="list-style-type: none"> Strategic management tools and techniques – Porter's forces, BCG matrix, SWOT analysis, Marketing mix, Ansoff matrix, PESTLE analysis, Maslow's hierarchy, 7S method IS integration – understanding legacy systems, vertical integration, horizontal integration, star integration 	
3. Be able to formulate an information systems strategy for an organisation	3.1 Recommend information systems options based on analysis of an organisation's strategy 3.2 Formulate an information systems strategy for an organisation in line with the organisation's strategy

Indicative Content

- IS organisational needs – planning organisational level analysis, job analysis, task analysis, needs analysis
- IS strategy – scope, planning, identifying IT needs, decision making, implementing the strategy

4 Understand the implementation process of an information systems strategy	4.1 Plan the implementation of an information systems strategy, considering benefits, costs, risks and priorities 4.2 Evaluate the risks associated with the planned implementation of an information systems strategy
--	---

Indicative Content

- IT strategy implementation – stakeholder analysis, mapping current situation, justifying decisions, scheduling the implementation, developing an IT policy
- IT risks – financial, technical, information related, user related, corporate culture

Innovative Technologies in Computing	
Unit Aims	Learners will develop an understanding of innovative developments in technology and their impact on the computer industry.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for this unit. Additional guidance is provided on the ATHE sample assignment brief. Learners will approach this unit from a theoretical perspective but examples from organisations and practical application in computing techniques will be required to illustrate the work. This is particularly the case for activities 2, 4 and 5 where the learner will need to apply their computing skills to the theoretical perspectives of this unit.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand innovative developments in technology	1.1 Evaluate the environments that utilise innovative technologies and identify current developments in the field 1.2 Analyse the impact of innovations in technology on society 1.3 Evaluate successes and failures of innovations in technology 1.4 Assess the dependency of environments on future developments in innovative technologies
Indicative Content	
<ul style="list-style-type: none"> Innovative technologies – current developments: big data exploration, cloud system deployment, Ubiquitous computing Technology innovation and society: knowledge society, social media, technology enhanced innovation processes Evaluating technology innovation: methods for evaluating innovation, technology evaluation, impact of technology innovation (success and failure) Dependencies between technology and its environment: technology and environment, technology sustainability, sustainable development 	
2. Understand impacts of technological innovations on the computer industry	2.1 Explain impacts of technological innovation on the way computer systems are used 2.2 Evaluate ethical issues relating to technological innovation in computing 2.3 Evaluate the impact of legislation on technological innovation in computing
Indicative Content	
<ul style="list-style-type: none"> Technological innovation and ethics: new ethical dilemmas, privacy, security Technological innovation and legislation: IPR, patents, copyright 	

Computing Research Methods	
Unit Aims	Learners will develop an understanding of different computer based research methods. They will plan their own research and carry out a research project based on an area of interest to them within computer science.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand computer based research techniques	1.1 Analyse computer based research techniques 1.2 Evaluate different sampling techniques commonly used in computer based research projects 1.3 Assess ethical issues in using computer based research techniques 1.4 Evaluate common data analysis tools and techniques
Indicative Content	
<ul style="list-style-type: none"> • Research techniques: desk research, ethnography, focus groups, interviews, online communities, mobile research, surveys • Sampling techniques: probability-based, selective, convenience-based, ethnographic methods • Ethics and research: ethical standards, ethics principles, ethics approval • Data analysis techniques: qualitative methods, quantitative methods, data analysis tools 	
2. Be able to plan a computer based research project on a topic within computer science	2.1 Develop a research proposal for a computer-based research project on a topic within computer science 2.2 Plan the data collection for a computer-based research project 2.3 Review the feasibility of a research proposal for a computer-based research project
Indicative Content	
<ul style="list-style-type: none"> • Research proposal structure: focus, relevant literature, method, ethics, decisions, schedule, resources, references • Data collection methods: exploratory, descriptive, analytical/explanatory, predictive • Research proposal feasibility: scope, topic selection, structure, managing time, managing data collection 	

<p>3. Be able to carry out research on a topic within computer science</p>	<p>3.1 Collect data for a computer based research project using appropriate techniques</p> <p>3.2 Analyse data for a computer based research project using appropriate tools and techniques</p> <p>3.3 Report findings of a computer based research project in line with research aims and preferred format for the intended audience</p>
<p>Indicative Content</p>	
<ul style="list-style-type: none"> • Data collection: primary data, secondary data • Data analysis: scientific rigor, deductive, inductive • Reporting: research outline, research foundation, research methodology, research results, research evaluation, research process reflection 	

Managing a computing project	
Unit Aims	Learners will find out about different project management tools and techniques that can be used when managing a computing project. They will use tools and techniques to plan, implement and review their own computing project.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand how to manage a computing project	1.1 Analyse methods for planning a computing project 1.2 Explain the roles and responsibilities within a project team 1.3 Critically evaluate project management tools and techniques that can be used when managing a computing project 1.4 Explain how to manage quality issues affecting computing projects
Indicative Content	
<ul style="list-style-type: none"> • Project planning methods: project specification, project plan structure, performance criteria • Project team structure: project roles, team structure, managing and motivating members • Project management tools: Brainstorming, Fishbone Diagrams, Critical Path Analysis Flow Diagrams, Gantt Charts • Project quality explained: defining quality, quality characteristics, quality assurance, quality control 	
2. Be able to manage a computing project	2.1 Follow a project plan to implement a computing project 2.2 Manage risks and issues in a computing project according to agreed procedures 2.3 Report on the progress of a computing project to appropriate stakeholders using agreed communication methods
Indicative Content	
<ul style="list-style-type: none"> • Project plan structure: work breakdown structure, logic network • Managing project risks: understanding risks, risk factors, risk assessment risk management strategies • Monitoring project progress: measuring progress, schedule plans, dealing with problems, PRINCE2 	
3. Be able review a computing project	3.1 Review computing project against agreed success criteria 3.2 Recommend improvements to any future computing project
Indicative Content	

- Project evaluation: evaluation plan, interpreting data, communicating results
- Post completion report: deliverable assessment, maintenance needs, project impact

Software development methodologies	
Unit Aims	Learners will learn about using software development methodologies to develop an information system.
Unit Level	5
Guided Learning Hours	48
Credit Value	12
Unit Grading Structure	Pass
Assessment Guidance	To achieve this unit, learners must achieve the learning outcomes and meet the standards specified by the assessment criteria for the unit. Additional assessment guidance is provided on the ATHE sample assignment brief.
Learning Outcomes – The learner will:	Assessment Criteria – The learner can:
1. Understand the role of methodologies in software development	1.1 Explain the differences between systems software and application software 1.2 Evaluate software development methodologies 1.3 Explain the phases of software development
Indicative Content	
<ul style="list-style-type: none"> • Systems lifecycle: information systems development, the lifecycle approach, software development lifecycle • Approaches in software development: data, processes, people, organisations, project management techniques • Software development methods: process oriented, object oriented, rapid development, people oriented, organisational oriented 	
2. Be able to design an information system using a software development methodology	2.1 Select a software development methodology to use when designing an information system and justify the selection 2.2 Use selected software development methodology to design an information system 2.3 Evaluate the chosen selected software development methodology
Indicative Content	
<ul style="list-style-type: none"> • Methodology selection: heavy versus lightweight, waterfall, RUP, Spiral models • Agile methods: Scrum, Extreme Programming • Evaluating methodologies: identifying evaluation criteria, frameworks for methodology evaluation 	